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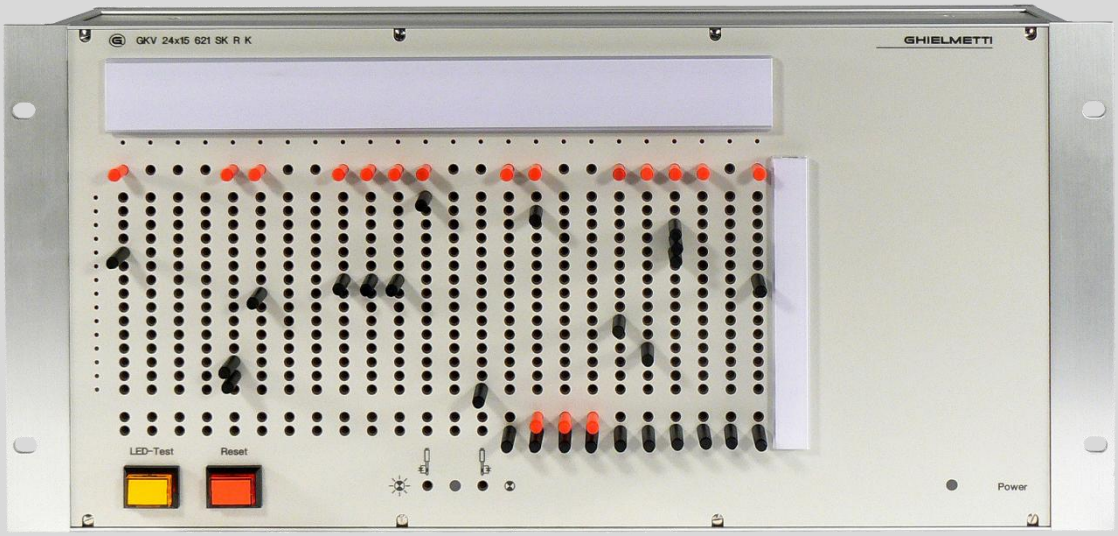


GKV 24x15 621 SK R ELDP

Tripping Matrix for Generator Protection

Operating Manual

Description

GKV 24x15 621 SK R ELDP
Tripping Matrix for Generator Protection
Part. Nr. 674.115.210.00

The tripping matrix GKV 24x15 621 SK R ELDP is a component of a generator protection system. The tripping matrix provides a transparent, easily programmable facility for combining output commands of the trip outputs of individual protection devices with plant items such as the circuit-breakers, de-excitation etc. The matrix was developed for marshalling tripping commands of large power stations. With its help, the tripping schematic can be temporarily changed, e.g. in case of a generator circuit-breaker revision. If the software matrix incorporated in each generator protection unit is used for marshalling the tripping commands, the marshalling in the protection units must be changed for this purpose.

The tripping matrix assigns the tripping signals arriving at the matrix columns (from the solid-state protection relays) to the freely programmable matrix lines to which the tripping modules are connected.

Introduction

Thank you for choosing a GHIELMETTI product.
We are convinced that your choice will prove to be a wise and worthy decision for many years to come. Your GHIELMETTI product has been tested for performance at the factory according to the specifications given for the system in this manual. However, before putting the device into operation we kindly ask you to read this manual and act according to the instructions given. All information given in this document is property of Ghielmetti Solutions AG. To the knowledge of Ghielmetti Solutions AG there are no errors in the manual. Should any errors be discovered, please notify us. Ghielmetti will under no circumstances accept responsibility neither for errors in this manual, nor consequences of such errors.

Warranty

Ghielmetti warrants products for one year from date of purchase against defects in materials and workmanship. During the warranty period, Ghielmetti will, at its option, either repair or replace products that prove to be defective. The warranty does not cover any defects caused by accident, misuse, neglect, improper or inadequate installation or maintenance by buyer, buyer-supplied software or interfacing, unauthorized modification, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

Safety Considerations

General
This product and related documentation must be reviewed for familiarization with safety
markings and instructions before operation. This product has been designed and tested in accordance with international standards.

Safety Earth Ground
This is a Safety Class 1 product (a protective earth terminal GND is provided).
An uninterrupted safety earth ground must be provided from the main power source to the product input wiring terminals, power, cord, or supplied power cord set.
Whenever it is likely that the protection has been impaired, the product must be made
inoperative and secured against any unintended operation.

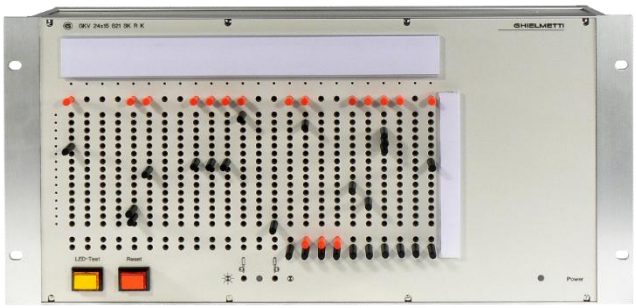
Installation

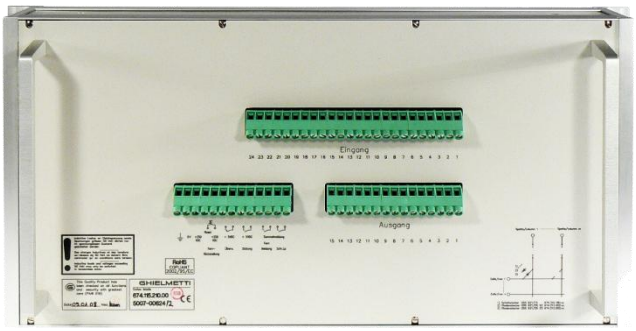
Initial Inspections
Check the contents of the shipment for completeness and possible transport damage.
If the contents are incomplete or damaged, contact Ghielmetti immediately to get the concerned parts repaired or replaced.

Before Applying Power
Verify that the product is configured to match the available main power source per the input power configuration instructions provided in this manual.

Servicing
Servicing, adjustments, maintenance or repair of this product may be performed by qualified personnel only.

Operating Mode





The tripping matrix GKV 24x15 621 SK R ELDP has 24 columns (for 45 signals from protection units) and 15 rows (for 15 signals to tripping modules)

High reliability diode plugs (black handle) are used for programming the matrix, the reliability being attained by generous over-rating with respect to forward current and reverse voltage.

The diode plugs are inserted from the front and enable any vertical column (signals from the protection relays) to be connected to any horizontal line so that the tripping signals can be transmitted to the tripping module.

Withdrawing a central red connecting plug can disconnect all tripping channels of a column. Each column has a LED for indicating tripping commands. The display is stored.

Each additional incoming tripping command received additionally sets a group memory, which, for example, can be used for remote signalling and switching a cubicle lamp.

All signals remain stored even when the tripping channels are interrupted or when the red central connecting plug is removed.

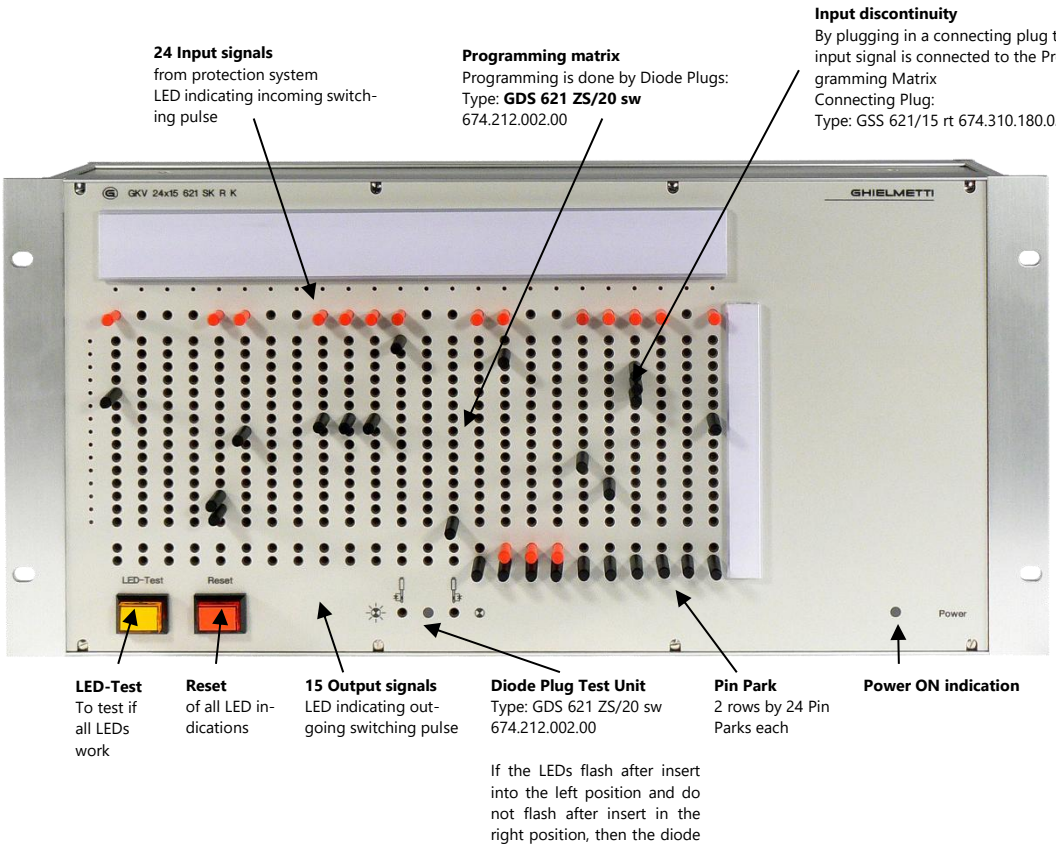
The memories can be reset directly by a push-button "Reset" or by remote reset.

The function of all LED's may be checked by pressing the "LED-Test" button.

The power supply of the relays and memory functions is 250VDC and feed an additional 5 VDC voltage for the LED function. The monitoring of the power supply is done by two relay contacts.

Optional: A lockable plexi-cover inhibits unauthorised access to the programming matrix.

Unused diode and connecting plugs are stored in a pin park.



24 Input signals
from protection system
LED indicating incoming switching pulse

Programming matrix
Programming is done by Diode Plugs:
Type: **GDS 621 ZS/20 sw**
674.212.002.00

Input discontinuity
By plugging in a connecting plug the input signal is connected to the Programming Matrix
Connecting Plug:
Type: GSS 621/15 rt 674.310.180.02

LED-Test
To test if all LEDs work

Reset
of all LED indications

15 Output signals
LED indicating outgoing switching pulse

Diode Plug Test Unit
Type: GDS 621 ZS/20 sw
674.212.002.00

If the LEDs flash after insert into the left position and do not flash after insert in the right position, then the diode

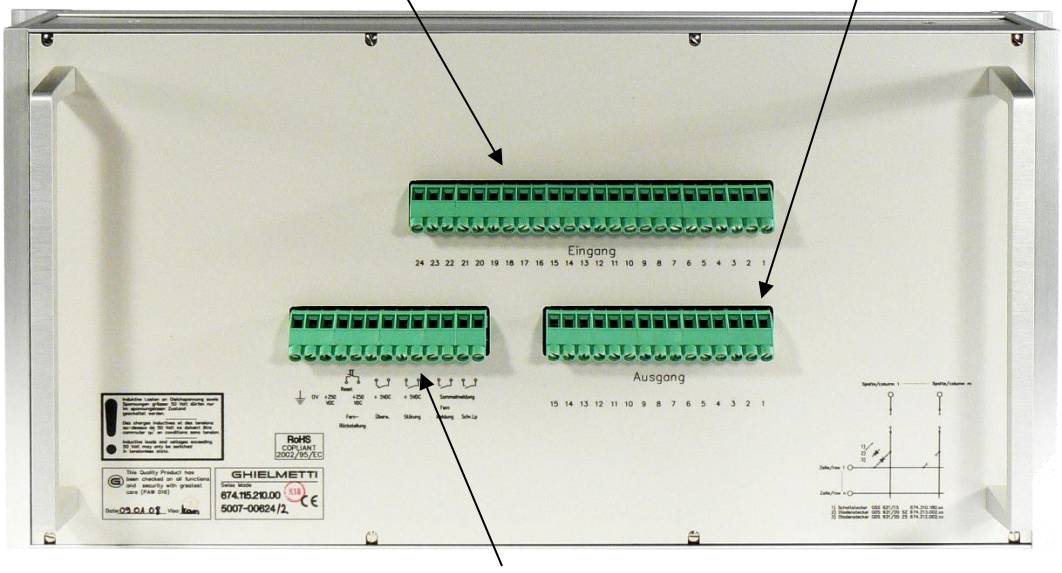
Pin Park
2 rows by 24 Pin Parks each

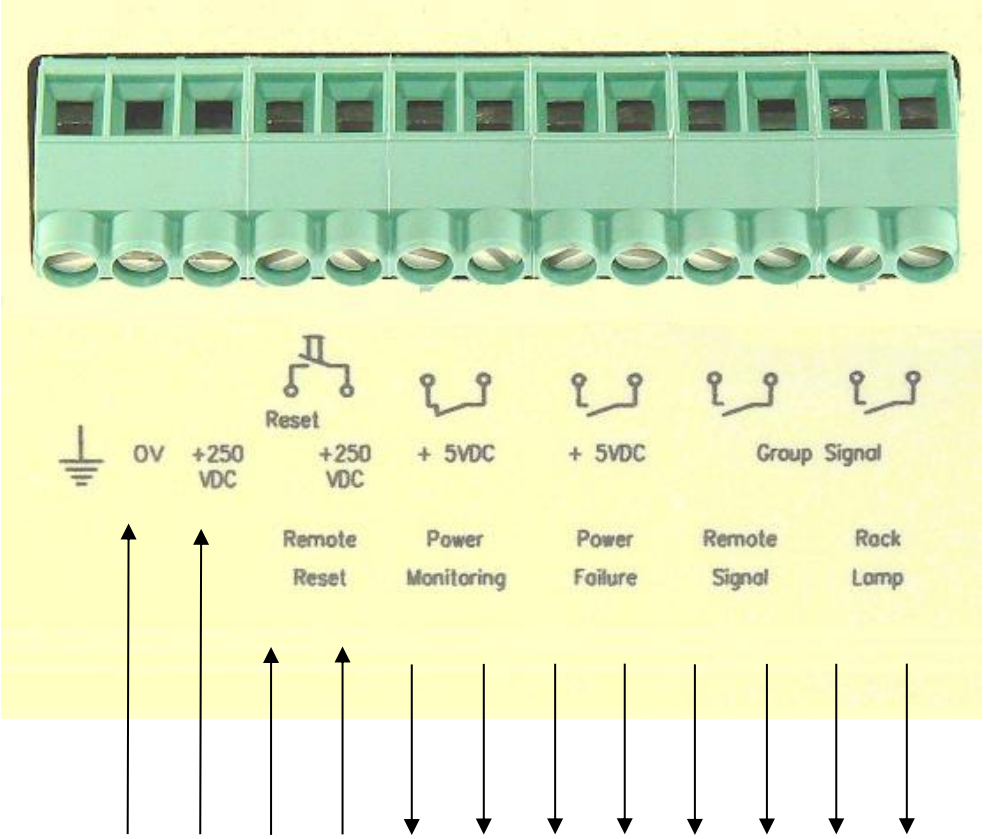
Power ON indication

Interconnecting the Tripping Matrix

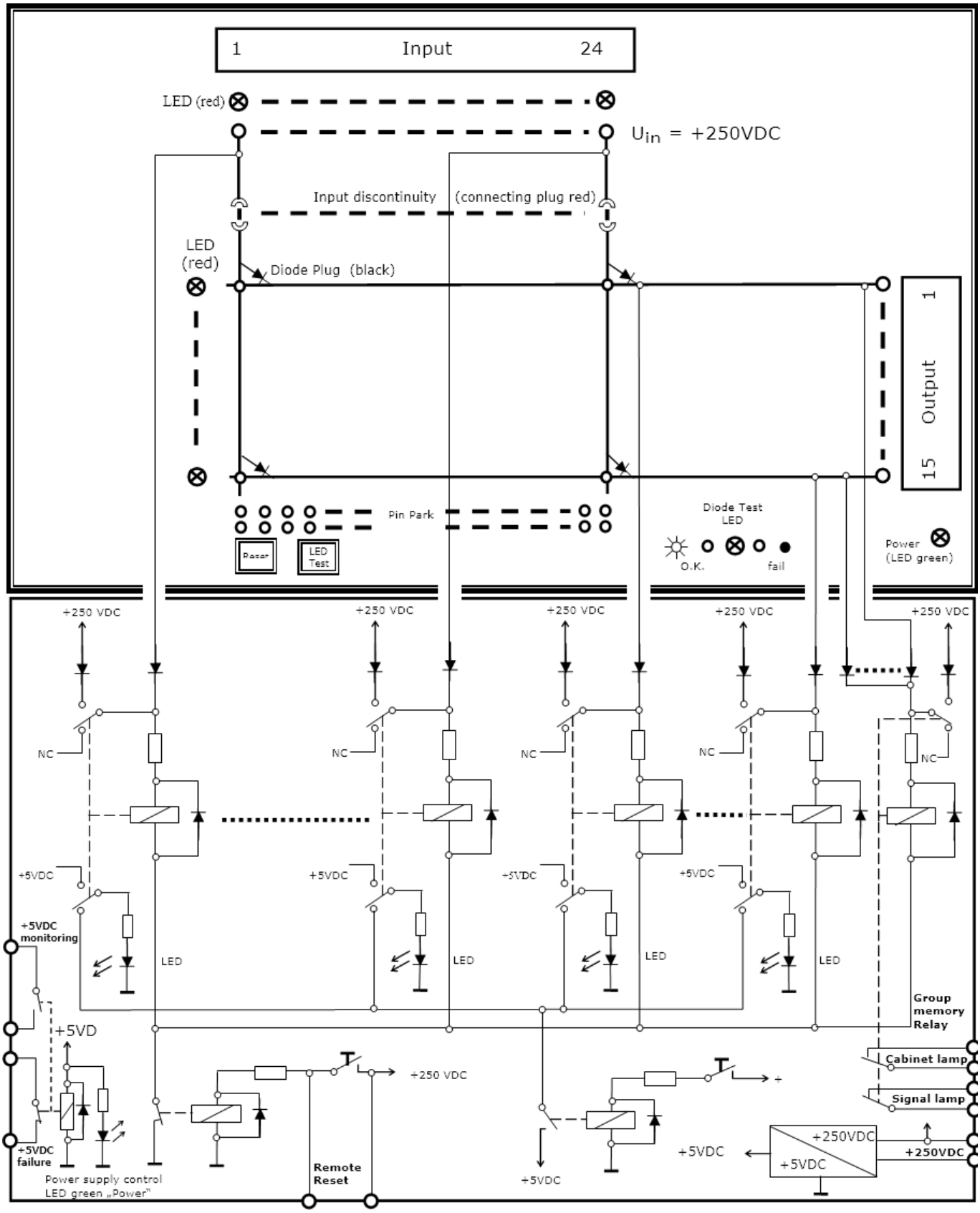
Input screw mount connectors
Max. 24 input signals (1 ... 24)

Output screw mount connectors
Max. 15 output signals (1 ... 15)

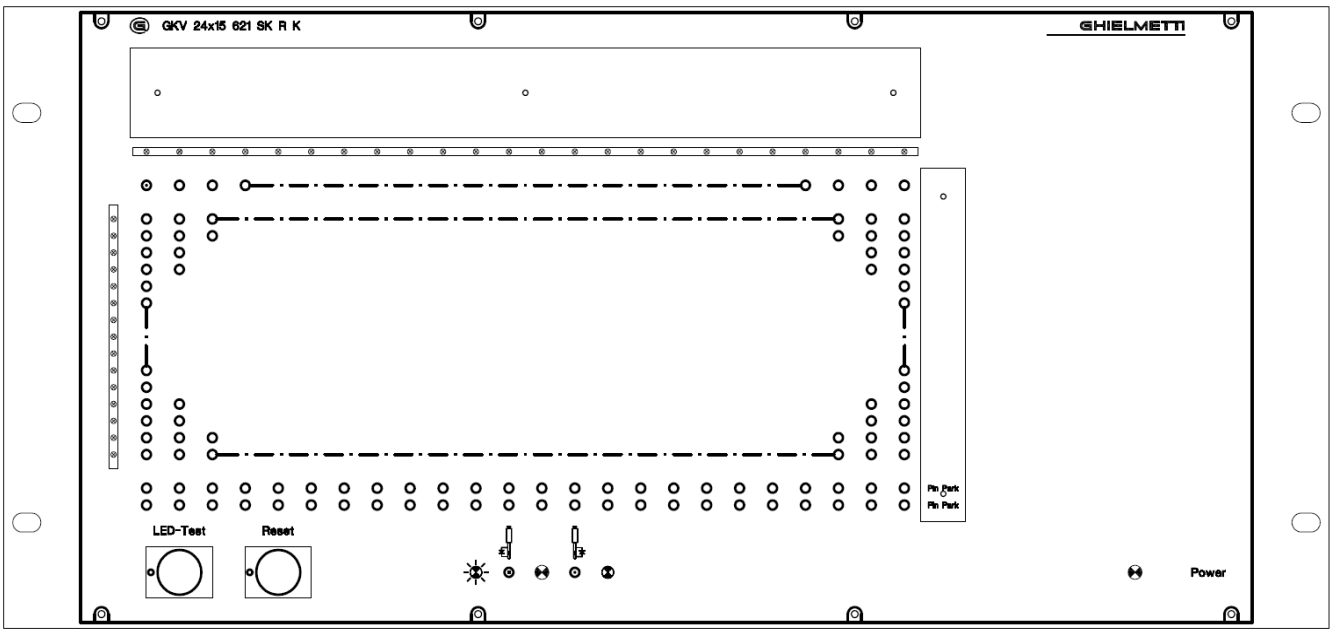



Reset
0V
+250 VDC
+250 VDC
+ 5VDC
+ 5VDC
Group Signal
Remote Reset
Power Monitoring
Power Failure
Remote Signal
Rack Lamp

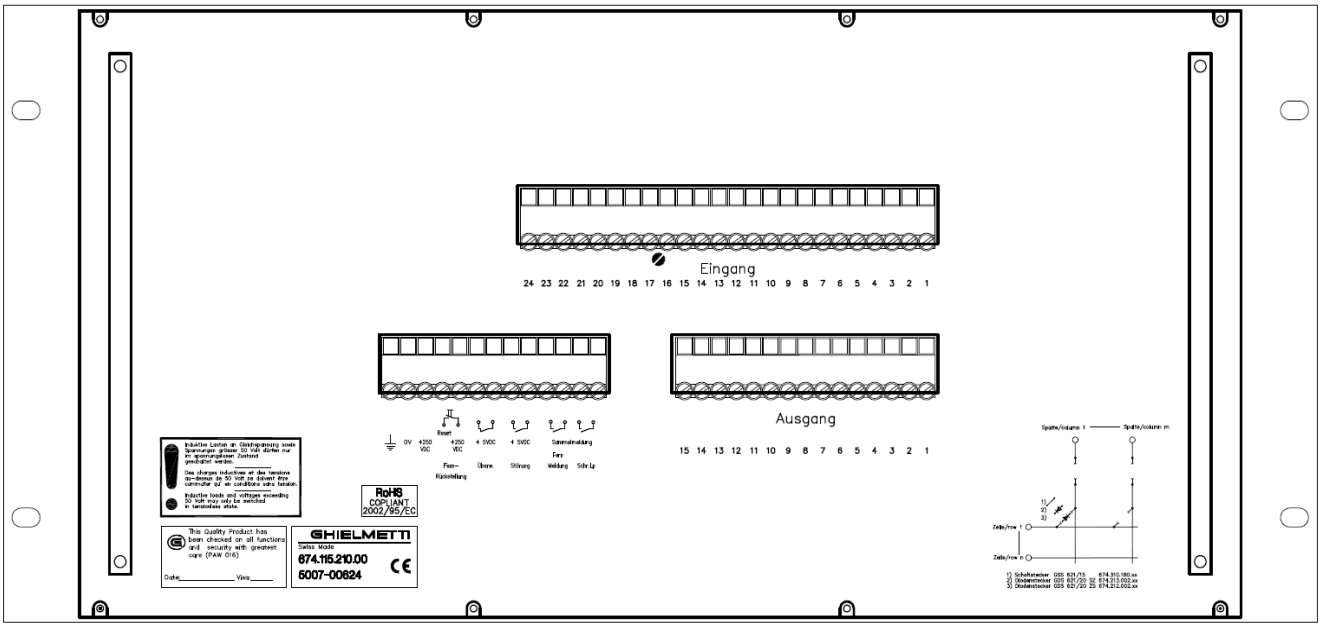
Functional diagrams



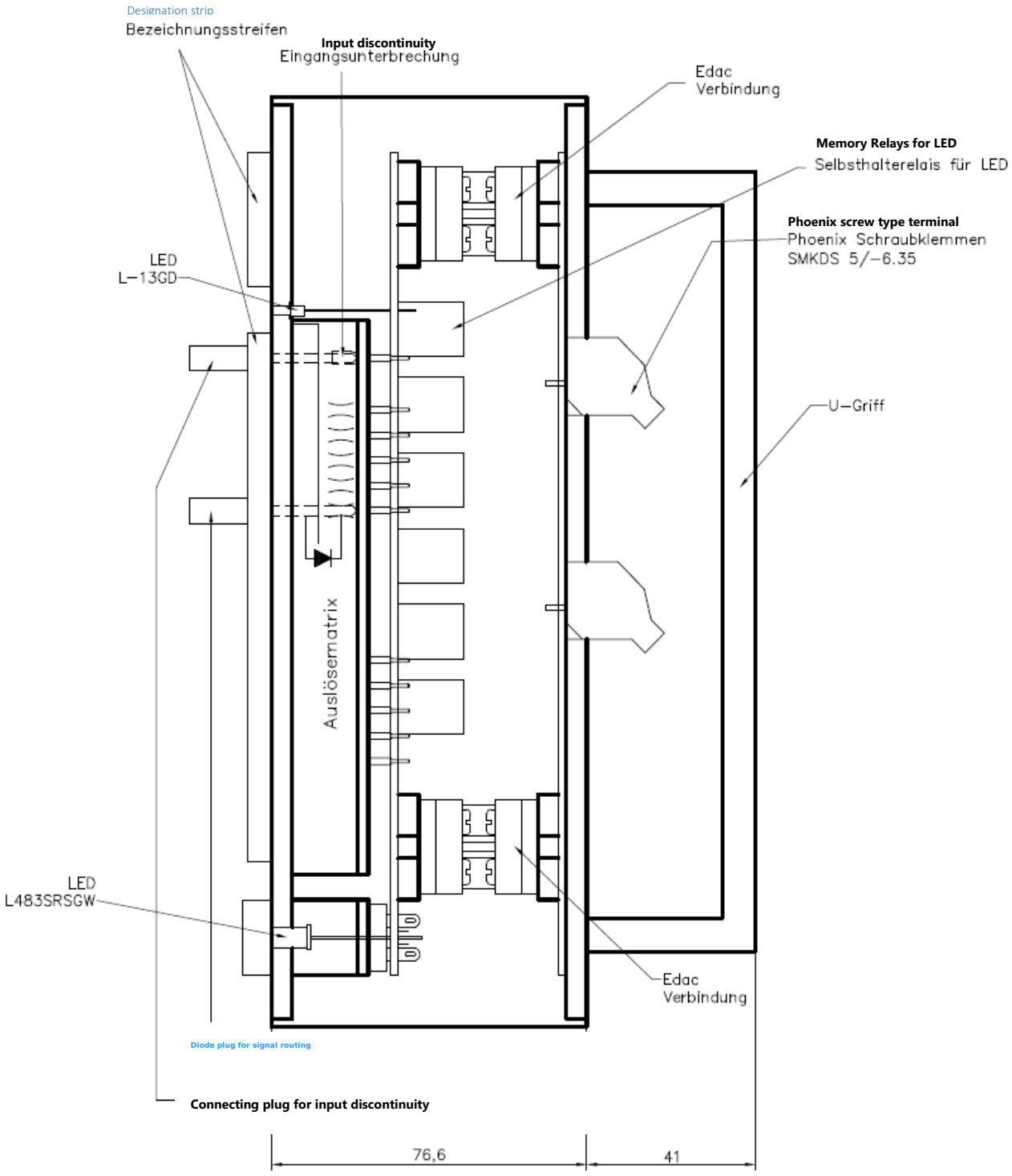
Front View



Back View



Side View


Designation strip
Bezeichnungsstreifen
Input discontinuity
Eingangsunterbrechung
Edac
Verbindung
Memory Relays for LED
Selbsthalterelais für LED
Phoenix screw type terminal
Phoenix Schraubklemmen
SMKDS 5/-6.35
LED
L-13GD
U-Griff
Auslösematrix
LED
L483SRSGW
Edac
Verbindung
Diode plug for signal routing
Connecting plug for input discontinuity
76,6
41

Technical Data

Voltage supply U_H	+250 V_{DC}
Range of voltage supply:	+176 ... 288 V_{DC}
Superposed AC peak-to-peak voltage:	≤ 12% @ rated voltage ≤ 6% @ voltage limits
Power consumption:	1 W in standby 3 W max.
Bridging period on auxiliary voltage failure:	≥ 50ms to U_H ≥ 110 VDC

Display memory	
Number of indication memories	15
Number of group memories	1
Indication delay time	≥ 5 ms

Alarm contacts	
Alarm relays for „ tripping command dispatched" indication	2 NO contacts
Switching capacity make/break	20 VA
Switching voltage	250 $V_{AC/DC}$
Permission current	0,1 A @ 250 V_{DC}

Matrix	
Number of columns (inputs)	24
Number of input indication LED	24
Number of rows (outputs)	15
Number of output indication LED	15

Diode plugs	
Type	GDS 621 ZS/20 sw part. no. 674.212.002.00
Max. reverse voltage	1000 V
Max. permissible current	1 A
Current flow direction	from column (+) to row (-)

Insulation	
Specification:	IEC 255-5
Max. voltage (input, output)	2,8 kV_{eff}, 50 Hz
Max. over voltage	5 kV_{peak}, 1,2/50 µs, 0,5 J 3 positive and 3 negative pulse within 5 sec. each

Climate conditions	
Operation temperature	-5 °C to +55 °C
Storage temperature	-25 °C to +55 °C

Construction	
Mechanical dimensions	19", 5 RU W x H x D = 480 x 220 x 120 mm
Weight:	approx. 5.7 kg

Connectors	
Clamp-connectors	max. wire diameter 2,5 mm^2

Electrical Tests

Isolation tests	
Standards	IEC 255-5
Voltage test (all circuits without auxiliary supply)	2 kV_{eff}, 50 Hz
Voltage test (auxiliary supply)	2.8 kV_{DC}
Surge voltage (Type test)	5 kV_{pp}; 1,2/50 us;0,5 J 3 positive and 3 negative surges within 5 sec.

EMC-Test, interference resistance (Type test)	
Standards	IEC 255-6; IEC 255-22; EN 50082-2
High frequency test IEC 255-22-1, class III VDE 0435 part 303, class III	2,5 kV_{pp}; 1 MHz t = 15us; 400 surges/sec
Electrostatic discharge IEC 255-22-2, class III IEC 1000-4-2, class III	4 kV / 6 kV contact discharge, 8 kV air discharge
Irradiation High frequency field, unmodulated IEC 255-22-3, class III	10 V/m; 27 MHz to 500 MHz
Irradiation High frequency field, amplitude-modulated IEC 1000-4-3, class III	10 V/m; 80 MHz to 1000 MHz; 80% AM; 1 kHz

Irradiation High frequency field, pulse-modulated IEC 1000-4-3, class III	10 V/m; 900 MHz; repetition rate 200 Hz
Fast transient bursts IEC 255-22-4 IEC 1000-4-4, class III	2 kV; 5/50 ns; 5 kHz; burst 15 ms repetition rate 300 ms, both polarities R_i = 50 Ohm; test-duration 1 min
Conducted emission high frequency IEC 1000-4-6, class III	10 V; 150 kHz to 80 MHz; 80 % AM; 1 kHz
Magnet field with energy-technical frequency IEC 1000-4-8, class IV IEC 255-6	30 A/m; constantly; 300A during 3 sec.; 50 Hz 0,5 mT; 50 Hz

EMC interference resistance, (Type test)	
Standards	EN 50081 (generic standard)
Conductes emission radio interference voltage (auxiliary supply) CICPR 22, EN 5502, limit value class B	150 kHz to 30 MHz
Radio field strength CICPR 11, EN 55011, limit value class B	30 MHz to 1000 MHz
Voltage test (all circuits without auxiliary supply)	2 $kV_{eff,}$ 50 Hz
Voltage test (auxiliary supply)	2.8 kV_{DC}

Mechanical Tests

Vibration stress and shock loading steady state	
Standards	IEC 255-21, IEC 68-2
Vibration IEC 255-21-1, class I IEC 68-2-6	sinusoidal 10 Hz to 60 Hz: ± 0,035 mm amplitude 60 Hz to 150 Hz: 0,5 g acceleration frequency sweep 1 octave/min. 20 cycles in the 3 axes vertical
Shock IEC 255-21-2, class I	half-sinusoidal acceleration 5 g, during 11 ms, 3 shocks in both directions of the 3 axes each
Vibration with earthquake IEC 255-21-3, class I IEC 68-3-3	sinusoidal 1 Hz to 8 Hz: ± 3,5 mm amplitude (hor. axis) 1 Hz to 8 Hz: ± 1,5 mm amplitude (vert. axis) 8 Hz to 35 Hz: 1 g acceleration (hor. axis) 8 Hz to 35 Hz: 0,5 g acceleration (vert. axis) frequency sweep 1 octave/min 1 cycle in the 3 axes vertical

Vibration stress and shock loading on transportation	
Standards	IEC 255-21, IEC 68-2
Vibration IEC 255-21-1, class II IEC 68-2-6	sinusoidal 5 Hz to 8 Hz: ± 7,5 mm amplitude 8 Hz to 150 Hz: 2 g acceleration frequency sweep 1 octave/min. 20 cycles in the 3 axes vertical
Shock IEC 255-21-2, class I IEC 68-2-27	half-sinusoidal acceleration 15 g, during 11 ms, 3 shocks in both directions of the 3 axes each

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